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ABSTRACT

The purpose of phase I of a feasibility study was to provide information to serve as guidelines for implementation of telecommunications into the office technology curriculum at Jefferson College. Extensive research of available literature and interviews with users and vendors of telecommunications equipment provided the background necessary for developing a survey instrument to collect telecommunications data from 43 St. Louis, Missouri businesses currently using telecommunications as a part of their routine business operations. Data from 23 of the businesses indicated that word/information processing personnel need preparation for entry-level positions in telecommunications concepts, special vocabulary, and experience with telecommunications equipment. A conclusion of the study was that a real need exists to incorporate telecommunications into the curriculum of the word/information processing program at Jefferson College. Further study was recommended to determine the most economical, practical methods for infusion of this technology into the curriculum. (Attachments include a description of procedures, a bibliography, survey findings, a partial glossary of telecommunications terms, and the instrument.) (YLB)

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FINAL REPORT

# PHASE I FEASIBILITY STUDY TO GATHER INFORMATION FOR IMPLEMENTING TELECOMMUNICATIONS INTO OFFICE TECHNOLOGY CURRICULUM

Project No. 84-131/132-600-2(145-145)A

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December 19, 1983

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ABSTRACT

The purpose of this study was to conduct Phase I of a feasibility study to provide information to serve as guidelines for implementation of telecommunications into the Office Technology curriculum at Jefferson College.

Extensive research of available literature and interviews with users and vendors of telecommunications equipment provided the background necessary for developing a survey instrument to be used to collect telecommunications data from St. Louis businesses. Forty-three major companies in the St. Louis area were identified as currently using telecommunications as a part of their routine business operations.

The survey instrument sought to gather data which could be used to determine requisite skills and concepts needed for entry-level positions in offices utilizing telecommunications equipment. The data collected from 23 businesses indicates that word/information processing personnel need preparation for entry-level positions in telecommunications concepts, special vocabulary, and experience with telecommunications equipment.

The conclusions of this study are that a real need does exist to incorporate telecommunications into the curriculum of the word/information processing program at Jefferson College. Various methods to incorporate this technology into the curriculum have been explored, and it is recommended that further study be conducted to determine the most economical, practical methods for this implementation.

## Statement of the Problem

It is the responsibility of vocational educators to continually monitor and evaluate the changing work environment to determine requisite skills and concepts needed by students for employment in the field for which they are trained. Educators in office technology programs recognize that electronic information processing equipment has created changes in skill levels required for entry-level office positions. Telecommunications is the fastest-growing segment of the technologies associated with the electronic office and is rapidly changing many traditional office tasks. This technology is becoming an integrated part of the information processing system, and its use demands discriminating study to determine how it can best be incorporated into the word/information processing curriculum.

The purpose of this study was to conduct Phase I of a feasibility study to provide information to serve as guidelines for implementation of telecommunications into the office technology curriculum at Jefferson College.

## Objectives

1. The first objective of the study was to research literature so that the investigators could develop background information essential to discuss telecommunications.

Telecommunications is the use of electronic impulses to send, receive, distribute, process, and store information. Since it involves a highly technical vocabulary and complicated concepts, available literature was researched as the first phase of the study. A complete bibliography of literature researched is included in the Attachments, Section C, Part 4.

In order to gain a better understanding of telecommunications concepts, three companies were contacted and appointments were made to visit telecommunications operations and to consult with telecommunications specialists. These three companies, McDonnell Douglas Automation Company, Ralston-Purina, and Edward D. Jones & Co., shared materials and/or demonstrated telecommunications operations.

2. The second objective of this study was to identify companies in the St. Louis area presently using telecommunications.

As there is no formal list of telecommunications users in the area, several methods had to be used to identify current telecommunications users. The first step involved attending business equipment exhibits at the St. Louis Convention Center where vendors were contacted and literature pertaining to telecommunications was collected. The president of a professional telecommunications association was contacted, and personal contacts were made through the St. Louis Chapter of Association of Information Systems Professionals. Forty-three companies were identified as users in various phases of telecommunications. A contact person was identified for each company to be used in the study.

The study is limited in that it identifies companies in the metropolitan St. Louis area which are presently active in telecommunications applications. No attempt is made to compare St. Louis firms with other areas of the country, and only St. Louis firms now actively engaged in telecommunications applications were studied. Any future plans for the St. Louis area have not been anticipated. It does, however, seem reasonable that requisite skills and concepts for employment in the St. Louis area would

apply equally as well for other geographic areas with comparable businesses.

3. The third objective of the study was to determine telecommunications skills needed by students seeking employment with companies using telecommunications in the St. Louis area.

The results of this study indicate that a need does exist to include telecommunications as a part of the word/information processing curriculum at Jefferson College. Special vocabulary, experience with telecommunications equipment, and knowledge of telecommunications concepts have been identified as valuable tools for persons seeking positions in offices using telecommunications equipment.

Of the 23 survey forms returned, 17 respondents stated that there is a need for knowledge of telecommunications concepts; 12 participants of the study stated that experience on telecommunications equipment is important; and 9 respondents indicated that special telecommunications vocabulary is needed by word/information processing personnel. Only one respondent remarked that no special skill is necessary. The total responses differ from the total number of questionnaires in that respondents were not limited to only one answer.

After extensive study of the survey results, it is recommended that plans be implemented to alter the word/information processing curriculum to include these telecommunications skills and concepts as a part of the total program in office technology.

4. The fourth objective of the study was for the investigators to research vendors in the St. Louis area to determine the kinds of equipment available for telecommunications.

The number of vendors for telecommunications equipment in the St. Louis area is large; and each vendor offers a variety of equipment and services, most of which is designed expressly for specific brands of equipment. Various equipment possibilities were explored with the focus centering on two companies which already have equipment on the campus for instructional purposes. Although many possibilities exist, Lanier Business Products or MCI Telecommunications appear to be the most logical firms to provide equipment for telecommunications capabilities.

Jefferson College's electronics department will soon have MCI's completely operational telephone switching station with a 1,000-port computer switch available for teaching the technical aspects of telecommunications. MCI representatives are presently studying the feasibility of the sharing of this equipment with the electronics department as a solution for teaching telecommunications in the word/information processing curriculum.

Lanier Business Products is the company which manufactures the word processors and centralized dictation system for the word/information processing department. There are two types of systems currently installed--a shared system with 15 screens which can communicate with each other through the CPUs, and four standalone word processors which have no communications capabilities. According to quotes from the manufacturer, it would take approximately $4,500 to interface the standalones with the

shared system and $2,000 to purchase the software which would give the entire system communications capabilities. In addition, a modem would have to be purchased, at a cost of $350 to $400. This would allow the college system to communicate with any other system which had a modem and communications software.

5. The fifth objective of the study was to prepare an equipment, space, and curriculum needs inventory for implementing telecommunications into the word/information processing curriculum.

Questions 21 and 22 of the survey dealt with the knowledge and skills desired for word/information processing personnel. Of the 23 respondents, 12 indicated that experience with telecommunications is desirable, and 10 indicated hands-on telecommunications activities would be recommended. It has been determined that as soon as it is economically feasible, equipment from Lanier, or MCI, or both, should be purchased to make this training available to word/information processing students. With the information now available, it is anticipated that no extra space would be needed for any of the equipment being considered.

Seventeen of the 23 respondents indicated that knowledge of vocabulary and concepts of telecommunications is desirable for word/information processing graduates.

Major topics have been identified as necessary to provide the concepts of telecommunications, and a partial vocabulary list is included in the glossary of this report. Topics to be included in a concepts course should include Physical and Electronic Distribution, TWX/Telex, Facsimile,

Terminal-to-Terminal and Terminal-to-Computer Telecommunications, Network Systems Design, Telecommunications Procedures, Electronic Mail, and Teleconferencing.

The "hands-on" experience could be provided by terminal-to-terminal communications using existing word processing equipment with the additional purchase of a communications option or a communications package and modem which would allow communications to the same types of equipment at other sites.

6. The last objective of the study was to establish a preliminary curriculum for telecommunications. The results of this study show a definite need for the word/information processing curriculum at Jefferson College to incorporate telecommunications as an integrated part of the total program. Topics have been identified as major discussion materials for a concepts course. The vocabulary common for telecommunications operations has been partially identified. A definite curriculum cannot be fully defined until telecommunications equipment has been selected and procedures for that particular equipment established. More research is needed to complete a curriculum plan. However, plans are now being made to incorporate a unit on telecommunications in the Word Processing II lecture class for the spring semester of 1984.

Population and Sample

All of the major users of telecommunications which could be identified in the St. Louis metropolitan area were surveyed. Five of the companies

surveyed employ over 5,000 workers. Twelve of the surveyed companies employ between 1,000 and 5,000 workers. None of the surveyed companies employ fewer than 100 people. All companies surveyed had been involved in the telecommunications process for at least two years. A list of the surveyed companies follows:

ACF Industries, Inc.
A. G. Edwards & Sons, Inc.
Anheuser Busch Companies
Amax Lead & Zinc
Arthur Andersen and Company
Boise Cascade Co., Can Division
Brown Group
Bryan, Cave, McPheeters & McRoberts
Calgon Corporation
Carboline Corporation
Charter National Life Insurance Company
Chemtech Industries, Inc.
Chromalloy American Corporation
Edward D. Jones & Co.
Emerson Electric
Ernst & Whitney
General Dynamics
Hewlett-Packard
Kellwood Corporation
McDonnell Douglas Automation Co.
McDonnell Douglas Aircraft Corporation
McGraw-Edison, Bussmann Division
Mallinkrodt, Headquarters Division
Mallinkrodt Laboratories
Maritz Motivation
May Department Stores
Missouri Pacific Union Pacific Railroad
Monsanto World Headquarters
Peat, Marwick, and Mitchell
Pet, Inc.
Ralston-Purina
St. Louis University Hospital Systems, Bio Med Division
Scott AFB
The Seven-Up Company
Union Electric
USAF
US Army Ag Pub Ctr
US Army Hq Cmnd

United Technologies Communications Company
United Van Lines
Wausau Insurance Company
Wetterau, Inc.
Wetterau, Inc., Headquarters

## Conclusions

1. Telecommunications is the fastest-growing segment of the technologies of the electronic office.

2. Although 43 major firms were identified as users of telecommunications for purposes of this study, many others are engaged in or anticipate being engaged in telecommunications within the next few months.

3. The sheer number of vendors manufacturing and selling telecommunications equipment is an indication of the growth of this field.

4. The data collected show that employers prefer that word/information processing personnel have some background in telecommunications.

5. Vocational programs in word/information processing need to include telecommunications as a part of the curriculum.

## Recommendations

1. It is recommended that further study be conducted to determine the most economical and practical methods for implementing telecommunications into the curriculum.

## Disclaimer

The activity which is the subject of this report was supported in whole or in part by funds from the Department of Elementary and Secondary Education, Division of Career and Adult Education. However, the opinions

expressed herein do not necessarily reflect the position or policies of the Missouri Department of Elementary and Secondary Education or the Division of Career and Adult Education, and no official endorsement should be inferred.

ATTACHMENTS

ATTACHMENT A

PROCEDURES

A thorough study was made of available literature on telecommunications to provide background information necessary to conduct an investigation into the telecommunications methods being used in the St. Louis area. The investigators attended equipment exhibits, conferences, and meetings and contacted resource personnel for telecommunications information. Extensive notes were made identifying persons and businesses engaged in telecommunications. Vendors were contacted, and professional word processing and telecommunications association members were asked to provide information. A variety of sources was utilized to compile a list of 43 companies presently using telecommunications equipment in the St. Louis area, and a contact person was identified for each company.

After companies using telecommunications in St. Louis were identified, the survey instrument was prepared. The four-page survey form contained 23 easy-to-answer questions, and a self-addressed, stamped envelope was included to provide ease in responding. Before the survey form was mailed, the contact person for each company was telephoned to explain the study and to ask for support in gathering the data.

Returns were received from 23 companies. The data were tallied and evaluated by the investigators. A copy of the survey instrument with the number of responses for each section is included in Part 4, Section D of this report.

The topics identified for the study of telecommunications concepts were determined by reviewing textbook materials and from information

gathered in discussions with telecommunications specialists. The investigators learned enough to realize that the data collected provides just enough background for a much more extensive study of telecommunications.

ATTACHMENT B

REFERENCES

There are no direct references for information in the body of the report.

The information in the glossary came from two textbooks: Word/ Information Processing Concepts and Procedures by L. Joyce Arntson and An Introduction to Computers and Information Systems by Robert A. Rademacher and Harry L. Gibson. Both are listed in Attachment C under Books.

ATTACHMENT C

BIBLIOGRPAHY

Books

Arntson, L. Joyce. Word/Information Processing Concepts and Procedures. Boston: Kent Publishing Co. 1983.

Datapro Reports on Telecommunications, Volume I. Delran, New Jersey: Datapro Research Corporation. 1983.

Datapro Reports on Telecommunications, Volume II. Delran, New Jersey: Datapro Research Corporation. 1983.

Jesperson, James and Fitz-Randolph, Jane. Mercury's Web: The History of Telecommunications. New York: Athenium Publications. 1981.

Kleinschrod, Walter, Leonard B. Kruk, and Hilda Turner. Word Processing: Operations, Applications, and Administration. Indianapolis: Bobbs-Merrill Publishing Co. 1980.

McCabe, Helen M. and Estelle L. Popham. Word Processing A Systems Approach to the Office. New York: Harcourt Brace Jovanovich, Inc. 1977.

Popyk, Marilyn K. Word Processing Essential Concepts. New York: Gregg Division/McGraw-Hill Book Company. 1983.

Rademacher, Robert A. and Harry L. Gibson. An Introduction to Computers and Information Systems. Cincinnati: South-Western Publishing Co. 1983.

Periodicals

Andrus, Mick. "A Case Study on Systems Integration." Words. Willow Grove, PA: International Information/Word Processing Association, April-May, 1983.

Arntson, Joyce. "A Tele-Curriculum." Words. Willow Grove, PA: International Information/Word Processing Association, August-September, 1981.

Asimov, Isaac. "The Electronic Mail." American Way. April, 1983.

Blackmarr, Brian R. "Office 2000." Words. Willow Grove, PA: International Information/Word Processing Association. June-July, 1982.

Computerworld on Communications. Framingham, Mass.: May 18, 1983.

Dzubeck, Francis X. "Telecommunications." Office Administration and Automation. New York: Geyer-McAllister Publications, Inc. June, 1983.

Dzubeck, Francis X. "Telecommunications." Office Administration and Automation. New York: Geyer-McAllister Publication, Inc. January, 1983.

Goldfield, Randy J. and Lance R. Brilliantine. "The Network As a Corporate Resource." Office Administration and Automation. New York: Geyer-McAllister Publication, Inc. January, 1983.

Green-Dorsey, Jean Audrey, "Electronic Mail and Message Services." Words. Willow Grove, PA: International Information/Word Processing Association, August/September, 1981.

Griesinger, Frank K. "The Manager's Guide To Telephone Systems." Office Administration and Automation. New York: Geyer-McAllister Publications, Inc. August, 1983.

Holtzman, Henry. "Local Area Networks Form Information Web." Modern Office Procedures. Cleveland, Ohio: Penton/PC, Inc. June, 1982.

Lindsey, Clifford M. and Robert G. Costain. "White Paper: Word Processing in Transition." Modern Office Procedures. Cleveland, Ohio: Penton/PC, Inc. June, 1982.

"Local Area Networks: Blessed Be the Tie That Automates." Modern Office Procedures. Cleveland, Ohio: Penton/PC, Inc. April, 1983.

Portway, Patrick. "White Paper: Communications: Uniting the Office of the Future." Modern Office Procedures, Cleveland, Ohio: Penton/PC, Inc. August, 1982.

Shea, Ellen. "Surveying the LANscape." Office Administration and Automation. New York: Geyer-McAllister Publications, Inc. February, 1983.

"The Technology Cafeteria." OAA Special Report. Office Administration and Automation. New York: Geyer-McAllister Publications, Inc. January, 1983.

Technology in Focus: Quarterly Review of Systems Technology, Volume I. Association of Information Systems Professionals. Willow Grove, PA: Summer, 1983.

Walshe, Willoughby Ann. "Solving the Standards Dilemma." Office Administration and Automation. New York: Geyer-McAllister Publication, Inc. February, 1983.

Wassel, Joanna. "Getting a Line on Telecommunications." Words. Willow Grove, PA: International Information/Word Processing Association. June-July, 1982.

Wolf, Sheldon. "Word Processing Plays Host to the Mailroom." Office Administration and Automation. New York: Geyer-McAllister Publications, Inc. April, 1983.

Interviews

Don Kountz, Manager, Employee Relations, MCI Corporation International Headquarters, New York.

Harvey Lehmon, Karen Braeutigam, and Ed Cavin, Consultants, Office Automation Sources, McDonnell Douglas Automation Co., St. Louis.

Jim Rhodes, Corporate Telecommunications, Ralston Purina Corporation, St. Louis.

Karen Story, President, Mississippi Valley Telecommunications Association, Brown Co., St. Louis.

Carol Morrison, Senior Staff Consultant, Productivity and Human Resources, Ralston Purina Corporation, St. Louis.

Alan Levy, Rolm Telecommunications Corp., St. Louis.

ATTACHMENT D

INSTRUMENT

The survey form used in the study had 23 items to be answered.

Question 1 was used to identify types of phone systems installed. Since most telecommunications installations involve telephone lines and phone systems, this was considered to be relevant information.

Question 2 was used to determine any anticipated changes in phone systems and the reasons for these changes.

Question 3 asked respondents what methods of communications were utilized. Eight methods were identified:

a. TWX/Telex are both teletypewriter networks of Western Union.

b. Facsimile is the transmission and reproduction of charts, graphs, drawings, and pictures as well as signed documents and other images over a long distance by electronic means. It is often described as long-distance copying.

c. Terminal-to-terminal, also called point-to-point, telecommunications is one wp system, printer, intelligent copier, or OCR sending or receiving from another wp system, printer, intelligent copier, or OCR.

d. Terminal-to-computer, also called point-to-computer, communications is the process of electronically transmitting information from a wp keyboard, intelligent copier, or terminal to a computer via telephone lines or hardwired (cable-connected) systems.

e. Videoconferencing is a meeting of two or more people who are geographically separated but who are connected simultaneously by a telecommunications system that uses two-way voice, text, and video communications. Because this is a relatively new process and is quite expensive, very few companies are using videoconferencing at this time.

f. Audio teleconferencing is a method of communications involving three or more persons connected by telephone simultaneously.

g. Teleprocessing is the processing of documents during transmission. For example, names and addresses can be merged with a letter and telecommunicated almost simultaneously.

h. Electronic mail is used to communicate documents or data through electronic means by using telecommunications lines or satellites. It may also include electronic messaging. Messages are typed and routed by computer to the terminal or screen of the receiver. Electronic calendaring, which allows users to have access to calendars of employees for purposes of scheduling appointments and meetings without telephone or personal contact, is also included in some electronic mail systems.

Question 4 asked what brand of word processing equipment each company used. This was used to develop a list of vendors to provide a reference for determining equipment available.

Question 5 was used to determine brands of computer equipment being used in St. Louis.

Question 6 asked how long each company had been using telecommunications.

Question 7 was used to determine the device used to communicate information. Four common keyboards were identified as input/receiving devices. These were:

a. Typewriter
b. CRT
c. Microcomputer
d. Minicomputer

Question 8 asked companies to identify types of material which were communicated. Five types of materials were identified as typical. These were:

a. signed documents
b. graphs and/or charts
c. short messages
d. text which can be revised by receiving terminal
e. text to be stored in terminal memory for later access

Question 9 was used to determine the locations to which materials were communicated. The options given were:

a. within same building
b. different buildings within St. Louis area
c. out-of-state sites
d. outside continental U.S.

Question 10 was used to identify facilities used in telecommunications. These included:

a. Public telephone--Because of the in-place availability and the capability to access virtually any point in the country, the facilities of the telephone companies have been the major carrier to date.

b. WATS (Wide Area Telephone Service)--This is a plan for using the public telephone network at rates different from the conventional costs. WATS offers a bulk rate for directly dialed station-to-station calls.

c. Value Added Network (VAN)--This is a special carrier service formulated to provide shared access using a system of computer switches and a concept known as packet switching.

d. Private or lease line service--These are provided by many companies in telecommunications, including AT&T, Western Union, MCI, RCA, etc. Single- or multi-point systems are offered.

e. Wideband analog service--These channels are the equivalent of 12 voice channels wide and offer two-point service only.

f. Digital service--The use of digital techniques for data transmission is a development of the past two years and involves the distortion of tne transmission signal. There is much less distortion with digital service than with analog service.

g. Satellite service--Satellite channels are offered for two-point and multi-point service as a less expensive alternative to telephone and leased lines.

Question 11 was used to determine protocol used by the equipment of the companies responding. A protocol is a set of conventions governing format and control of data. This allows separate users and equipment to access a common network. Five common protocols were listed:

a. TTY-ASCII compatible
b. BCS
c. SDLC
d. HDLC
e. X.25

Question 12 asked the respondents what synchronization method of transmission is being used. Equipment must have a similar synchronization technique. The methods are:

a. Bisynchronous (also called synchronous)--sends information in batches and does not require a start and stop instruction at the beginning and end of each character.

b. Asynchronous--Sends information one letter at a time with a start and stop code at the beginning and end of each character.

c. SDLC (Synchronous Data Link Control)--Is a line protocol by IBM.

Question 13 dealt with the speed of transmission. Equipment must send and receive at the same speed of transmission of characters to be accurate. There are several standard speeds of communication, and these are listed on the questionnaire.

Question 14 asked for specific brands of carriers utilized by the respondents. This was included to determine which vendors were used most frequently.

Question 15 was used to determine whether the companies responding used digital or analog transmission. Analog is the transmission of sound waves over telephone lines; digital transmission is sent in code using computer binary language.

Question 16 was used to determine the type of media used for communication.

a. Fiber optics is the use of laser beams to transmit information. This is the fastest-growing technology at the present time.

b. Coax (coaxial) cables are used for transmission of data.

c. Twisted pairs are copper wires twisted in pairs to reduce interference in data transmission.

Question 17 was used to determine whether or not companies responding used a network design. Networking is the ability to link a number of systems together to provide information services that are more cost effective and a better quality. Today networking involves primarily linking large computer systems with non-intelligent terminals.

Question 18 asked about the number of sites linked by the network. This was asked to determine which installations were larger.

Question 19 was used to determine whether or not companies used specific personnel as telecommunications specialists.

Question 20 was used to determine the kind of special training or background now being required for word processing personnel using telecommunications.

Question 21 was used to determine what telecommunications knowledge, if any, companies would like their word processing employees to have.

Question 22 asked specifically what type of training and experience companies would like for their word processing employees to have.

Question 23 was used to determine how many of the contact people would be willing to serve on an advisory committee should such a committee be established.

ATTACHMENT E

PARTIAL GLOSSARY OF TELECOMMUNICATIONS TERMS

| | |
|---|---|
| AUTOMATIC ANSWER | The feature by which an electronic typing system may receive text unattended |
| ANALOG CODING | Sound wave form of communication |
| ASYNCHRONOUS | A mode of transmission in which a unit can send information one character at a time with a start instruction before each character and a stop instruction after each character |
| BANDWIDTH | A measurement of the width of a range of frequencies |
| BAUD RATE | Unit of transmission speed and generally equates to the bits per second rate |
| BISYNCHRONOUS | A mode of transmission which does not require a start and stop instruction at the beginning and end of each character |
| BATCH | Blocks of characters transmitted at one time |
| BIT | An abbreviation for a binary digit and is the smallest unit of information in a binary system |
| BPS | Bits per second, a measure of transmission speed |
| BYTE | A sequence of bits and is equivalent to a character |
| CHANNELS | The physical link or medium that exists between two end points |
| COAXIAL CABLE | A transmission device that has one conductor within and insulated from another conductor of larger diameter |
| COMMON CARRIER | Private company, government regulated, that provides telecommunication service facilities |
| COMMUNICATION PROCESSOR | A digital computer that has been programmed to perform one or more communication functions |
| DEMODULATION | The process of reconverting transmitted data from analog back to digital data |

| | |
|---|---|
| DIGITAL CODING | Code using binary computer language of 1s and 0s; type of transmission code |
| DISTRIBUTION | The mailing, delivering, transmitting, and filing of a document |
| ELECTRONIC DISTRIBUTION | Electronic delivery of a document via telephone or satellite transmission |
| ELECTRONIC MAIL | Another name for telecommunicating a document electronically; may or may not include electronic messaging and calendaring |
| FACSIMILE | The process used for transmission and long-distance reproduction of charts, graphs, drawings, pictures, signed documents, and other images by electronic means via telephone lines or radio or microwave communications |
| FULL DUPLEX | Allows transmission to occur in both directions simultaneously (send and receive) |
| HALF DUPLEX | Communications flow in which data may be transmitted in only one direction at a time |
| INTEGRATED TECHNOLOGIES | Different types of equipment tied together through telecommunications |
| INTEGRATION | Ability to move information in usable form from one device to another |
| INTERFACE | Connecting device used to integrate systems |
| INTERORGANIZATIONAL NETWORK | Network of terminal-to-terminal or terminal-to-computer telecommunications between two or more organizations |
| INTRAORGANIZATIONAL NETWORK | Network established for telecommunications between branch locations within organizations |
| MESSAGE SWITCHING | Store-and-forward form of electronic mail that receives, stores, and distributes messages to the participants of a network |
| MODEM | Device used to convert digital signals into analog signals for transmission through telephone lines and analog signals back to digital form at the other end, also known as a data set |
| MULTIDROP LINE | Communications configuration that uses a single channel or common line in a polling mode to serve multiple terminals |

| | |
|---|---|
| NETWORK | The ability to link a number of systems together usually by telecommunications facilities to provide information services that are more cost effective and of better quality |
| PARITY CHECK | Method of checking the accuracy of electronic transmission |
| PHYSICAL DISTRIBUTION | Delivering of a document by manual or physical means, such as mail, courier service, and manual file |
| POLLING | Communications feature that allows a system to check with other terminals or devices to see if there are messages to transmit |
| PRIVATE CARRIER | Company in the business of mail delivery, an alternative to the U.S. Postal Service |
| PROTOCOL | Set of conventions for electronic transmission; includes modes, speed, character length, and code |
| SATELLITE | Electronic dishlike device that orbits the earth and is used to connect communications stations throughout the world via electronic beams |
| SIMPLEX | Transmission of communications flows in one direction only |
| SYNCHRONIZATION | Method of transmission |
| TELECOMMUNICATIONS | Electronic transmission of data between WP and DP equipment via telephone lines, hardwired cables, microwaves, and satellites |
| TELECONFERENCE | Electronic transmission of pictures and/or digital messages to audio visual computer-equipped facilities in different locations for the purpose of meeting and exchanging information |
| TELEPROCESSING | Processing of documents during telecommunications transmission |
| TERMINAL-TO-COMPUTER | Telecommunications from a WP system, intelligent copier, or terminal to a computer; also called point-to-computer |
| TERMINAL-TO-TERMINAL | Telecommunications between two locations used when one type of WP system, printer, or OCR sends to or receives information from a compatible device; also called point-to-point |

| | |
|---|---|
| TWX/TELEX | Western Union teletypewriter networks |
| VALUE ADDED | Term used to describe tasks now being done due to advanced technology that were not done before |
| VOICE MAIL | Store-and-forward voice messaging system to automate the delivery of telephone messages |

TELECOMMUNICATIONS SURVEY

Please circle all answers which apply.

1. What telephone system does your company presently use?

a. SL-1 Northern Telecom--2
b. Rolm CBX—4
c. Mitel SX--2
d. Siemens SD 192, SD 232, Saturn III—0
e. NEC NEAX-12--2
f. NEAX-22—0
g. United Technologies Lexar--2
h. Inte Com IBX--0
i. American Telecom Focus--3
j. American Bell Dimension--13
k. Dimension AIS/System 85—1
L. AT & T/Western Electric--3
m. Other _____

TIE—1
American Bell
Dimension 2000—2
DBX 1200--1
800 Cross Reed--1
SG1A North Telecom--1
Stromberg-Carlson--1

2. Do you plan to change telephone systems in the near future? If so, what do you plan to install and why are you changing systems?

No--12 Yes--9 Undecided--5
Under Review—2
In process of deciding--1
SL1Northern Telecom--1
United Tech Lexar--1
TIE--1

3. Which of the following methods of telecommunications does your company utilize?

a. TWX/Telex--21
b. Facsimile--19
c. Terminal to terminal--14
d. Terminal to computer--20
e. Videoconferencing--2
f. Audio Teleconference--12
g. Teleprocessing--7
h. Electronic Mail--6

4. What brand/brands of word processing equipment do you use?

IBM--12
IBM Displaywriter--3
Wang--7
Lanier--5
Xerox--4
NBI—3
CPT--2
4-Phase--1
Plexus--1
Dictaphone--1
3M--1

5. What brand/brands of computer do you use?

IBM—19
Wang--5
Apple--4
DEC--3
HP--2
Data Point--2
CCI—1
Radio Shack--1
Control Data--1
4-Phase--1
Data Gen--1
BBN--1
AMJacquard--1
Burroughs--1
COMTEN--1
Plexus--1
Onyx--1
Entrex--1

6. How long has your company been using data telecommunications?

2 yrs--1
3 yrs--4
5 yrs--2
6 yrs--1
7 yrs--2
10 yrs--5
15 yrs--4
30 yrs--1
no answer--3

7. What type device do you use for telecommunications?

a. typewriter--3
b. CRT—20
c. microcomputer--10
d. minicomputer--12

8. What type of materials are communicated?
   a. signed documents--9
   b. graphs and/or charts--11
   c. short messages--14
   d. text which can be revised by receiving terminal--15
   e. text to be stored in terminal memory for later access--12
   f. data and programs--1
   g. computer generated reports--1
9. To what locations do you communicate?
   a. within same building--19
   b. different buildings within St. Louis area--16
   c. out-of-state sites--21
   d. outside continental U.S. (if so, please list)--10
   Canada, Korea, Japan, Hawaii, Europe, Alaska, United Kingdom, Australia, S. Africa, Saudi Arabia, Germany, France

10. Which of the following facilities are used for communications?
   a. public telephone--16
   b. WATS--18
   d. Value Added Network—6
   e. Private or lease line service--17
   f. Wideband analog service--4
   g. Digital service--8
   h. Satellite--7
   i. Own microwave system and microwave system--1
11. Which of the following protocols does your equipment use?

   a. TTY-ASCII compatible--16
   b. BCS--8
   c. SDLC—8
   d. HDLC--4
   e. X.25—3 no answer--4
   f. Other _____ TCP-IP--1 2770-2780--1

12. What synchronization method of transmission is used?

   a. bisynchronous (synchronous)--18
   b. asynchronous--13
   c. Synchronous Data Link Control--7
   No answer--3
13. What is your transmission speed?

   a. 110—3
   b. 300--11
   c. 1,200--11
   d. 2,400—12 No answer--4
   e. 4,800--13 1.544 MBPS--2
   f. 9,600—12 19.2 KBPS--2
   g. Other_____ 56 KBPS--4

14. What kind/kinds of carriers are utilized in your company?

a. Common

1. AT&T--22 2. General Telephone & Electronics--1
3. Western Union--9 4. Other RCA Cylix--1
MCI--1

b. Specialized

1. International Telephone & Telegraph-5(2) RCA--5
3. Sprint-6 4. LDX-3 5. MCI-14(6) Other USTEL/ALNET--1
ISACOMM--1

c. Value-added carriers (VAN) TRT--1

1. GTE--1 2. RCA--1 3. Telenet--1 4. Tymnet--4
5. ADP--0 6. Other United Telecom--1

d. Satellite

1. Western Union--3 2. SBS--4 3. Other RCA Cylix--1
Rented--1
AT&T--1
ISACOMM--1
Thru LDX--1

15. What type of method do you use to transmit?

a. Digital--15
b. Analog--17

16. What type of media do you use for communication?

a. Fiber Optics--2
b. Coax Cable--17
c. Twisted Pair--16

17. Do you utilize a Network System Design? NO--7
If so, which of the following?

a. Intraorganization--5 b. Interorganization--5
c. Structured Network--6 d. Message Switching--4

18. How many sites are linked by your network?

a. 1 - 3 sites--0 b. 4 - 10 sites--4
c. 11 - 25 sites--3 d. 26 - 50 sites--0e. Over 50
10

19. Does your company have

a. specific personnel as telecommunications specialists--14
b. no specialists--staff all participate in telecommunications--1
c. combination of specialists and nonspecialists who use telecommunications--10

20. What kind of special training/background do you desire for word processing personnel participating in telecommunications activities?

a. no special training--0
b. on-the-job company trained--22
c. past experience--7
d. special vendor schools--8
e. other, please explain
In-house training--1

21. What would you like word processing personnel to know as preparation for employment in telecommunications?

a. special vocabulary--9
b. experience with telecommunications equipment--12
c. no special skills--1
d. knowledge of telecommunications concepts--17
e. other, please explain

22. What would you recommend schools in Missouri aim for in the process of supplying word processing employees with telecommunications skills for your company?

a. knowledge of vocabulary and concepts--17
b. experience with telecommunications activities--10
c. nothing--company will do training--1
d. other, please explain

23. If it is determined that there is a need to teach telecommunications on the community college level, would you be willing to serve in an advisory capacity to help establish a curriculum?

a. advisory committee--10
b. advice, but no committee--6
c. no--5 no answer--2

Please feel free to make any remarks which would help us determine whether a need exists for telecommunications training in word processing programs on the community college level.

Jefferson College Hillsboro, Missouri 63050 (314) 789-3951/942-3000

October 14, 1983

Dear :

The task of educating today's students for the high-technology office environment has taken on a new dimension. A number of studies conducted by business researchers, academicians, and consultants have shown that a critical office automation requirement is telecommunications. With the increasingly large number of offices using telecommunications as an integrated part of their information processing systems, it becomes essential for students to be trained in this area.

Linda Henson and I have been authorized by the Missouri State Department of Education through a research grant to study the need for adding telecommunications to office technology curriculums on the college level. Our first step in this research is to survey area businesses using telecommunications.

Would you please take a few minutes to complete the enclosed survey which we discussed by telephone. We have tried to ask a minimum number of questions and to make those questions easy to answer. Since we are working in a much smaller timeframe than we had anticipated, we would appreciate your returning the survey form to us in the enclosed self-addressed envelope by Friday, October 28.

Sincerely yours,

Myrna Sanders, Instructor
Office Systems and Technologies

MS:plf

Enclosures

## EXPLANATION OF EXPENDITURES

| | |
|---|---|
| Printing, paper, envelopes, and supplies . . . . . | $ 151.43 |
| Books . . . . . | 30.42 |
| Postage . . . . . | 31.57 |
| Transportation: | |
| AMS Machines Show (85 miles)<br>McDonnell Douglas Automation (105 miles)<br>Rolm Communications (88 miles)<br>Lanier Business Products (80 miles)<br>Edward D. Jones & Co. (90 miles) | |
| Total miles - 448 @ 17 cents a mile . . . . . | 76.16 |
| Telephone calls . . . . . | 10.42 |
| Salary: | |
| Myrna Sanders 60 hours at $10 an hour . . . . . | 600.00 |
| Linda Henson 60 hours at $10 an hour . . . . . | 600.00 |
| Total Expenditures | $1,500.00 |